McKESSON

James Fleer
Director, Environmental Services
Environmental Services Department

Via Electronic and Certified Mail

June 11, 2015

Mr. Stephen Tzhone, Superfund Remedial Project Manager
Superfund AR/LA Enforcement Section (6SF-RA)
U.S. Environmental Protection Agency
1445 Ross Avenue
Dallas, Texas 75202

Subject: Monthly Progress Report – May 2015
Arkwood, Inc. Site, Omaha, Arkansas

Dear Mr. Tzhone:

Pursuant to Section IX (B) of the corrected Consent Decree in this matter, the following monthly progress report is being submitted for the Arkwood, Inc. Superfund Site (Site).

I. CURRENT ACTIVITIES

The following is a general description of Work (as defined in the Consent Decree) activities commenced or completed during this reporting period:

During May, we operated the main water treatment system, collected operational samples and conducted Site maintenance activities. In addition to collecting samples for laboratory analysis of pentachlorophenol, field samples were collected to measure pH, temperature, and dissolved oxygen. Water samples were collected on May 18, 2015. The analytical data is attached to this report. A summary of the data is attached for reference. Samples at the New Cricket Spring mouth and weir will continue to be collected once per month until a reduction in frequency is approved by the agency. Based on commentary from EPA representatives regarding the potential for dioxin contaminants to be transported through the fracture system via sediment/colloidal particles, MMI also collected water samples at the mouth of New Cricket Spring and at the discharge weir from the treatment system for dioxin analysis. A copy of the analytical report is attached.

A meeting to discuss the recent soil sampling/risk assessment and supplemental dye tracing reports was held in Harrison, Arkansas and at the Site on May 19, 2015. The meeting was attended by representatives of the EPQ and ADEQ. ADEQ personnel inspected the area of the proposed drainage modifications and reported the activity will require a Section 404 permit but would likely qualify for the general permit process.

McKesson Corporation
One Post Street, 34th Floor
San Francisco, CA 94104

www.mckesson.com

II. PROJECT DATA
Attached.

III. PROJECTED ACTIVITIES

June: MMI plans to continue ongoing operations and Site maintenance activities. In addition, MMI will work to submit the application for the 404 permit to perform the drainage modifications. MMI will also initiate responses to expected comments from the risk assessment and supplemental dye trace studies.
July: MMI plans to continue ongoing operations and Site maintenance activities. Address any comments related to the 404 permit application and prepare to implement the drainage modifications. Pending receipt of the 404 permit, MMI intends to install the drainage modifications. The installation work will be performed during a sustained period of low flow from New Cricket Spring to maintain the treatment system in operation during the installation of the modifications.
August: MMI plans to continue ongoing operations and Site maintenance activities. Finalize any portions of the additional July work that remain uncompleted, if any.

IV. PROBLEMS ENCOUNTERED OR ANTICIPATED
No problems were encountered and no problems are anticipated.

I certify that the information contained in or accompanying this submission is true, accurate, and complete to the best of my knowledge, information and belief, and that I, as project coordinator, have made reasonable inquiry into its veracity.

If you have any questions regarding this monthly progress report, please do not hesitate to contact me at (913) 238-8348.

Sincerely,

James E. Fleer, Project Coordinator
Director, Environmental Services

Enclosures

Copy:
- Mark Moix, ADEQ
- Gloria Moran, EPA Assistant Regional Counsel (6RC-S)
- Lydia Johnson, Chief, Superfund Enforcement Branch (6SF-TE)

Arkwood, Inc. Site: Ozone Injection Pilot Study

	Variables		Spring	PCP	
Date	Water Inj	O3 Inj	Flow	Mouth	Weir
12/8/05			5		
12/9/05	35		5		
12/14/05	35	1lb/10 g	21	28	
12/15/05	35	1lb/10 g	30/27	29.3	
12/20/05	36	1lb/10 g	27	7.39	<5.10
12/26/05	36	1lb/10 g	27	11.4	11.1
1/2/06	36	1lb/10 g	21	42.4	35.1
1/9/06	36	1lb/10 g	20	32.4	33
1/16/06	36	1lb/10 g	27.5	32.3	<5.00
1/23/06	36	1lb/10 g	34/32	15.9	<5.00
1/30/06	36	1lb/10 g	41	34.3	<5.00
2/6/06	36	1lb/10 g	38	<5.10	<5.00
2/13/06	36	1lb/10 g	34	23.9	<5.00
2/20/06	36	1lb/10 g	21	5.53	4.19J
2/27/06	36	1lb/10 g	26	19.9	<5.00
3/6/06	34	1-2lb/10 g	16	25.1	<5.00
3/13/06	33	1-2lb/10 g	57	107	<5.00
3/20/06	32	1-2lb/10 g	48	26.2	<5.00
3/27/06	32	1-2lb/10 g	27	4.09J	<5.00
4/3/06	34	2-3lb/10 g	24	11.3	<5.00
4/10/06	33	2-3lb/10 g	16.4	39.3	<5.00
4/17/06	34	2-3lb/10 g	22	7.94	7.82
4/24/06	35	2-3lb/10 g	16	7.0	<5.00
4/27/06	33	2-3lb/10 g	50	11.3	NA
4/29/06	33	2-3lb/10 g	193	28.2	NA
5/1/06	33	2-3lb/10 g	94	23.4	7.16
5/8/06	33	2-3lb/10 g	59	52.3	23.3
5/15/06	34	2-3lb/10 g	21.7	14.9	<5.00
5/22/06	34	2-3lb/10 g	16	<5.00	<5.00
5/30/06	34	2-3lb/10 g	16.7	5.64	<5.00
6/7/06	0	0	3	253	<5.00
6/12/06	0	0	2.19	LE	LE
6/19/06	34	0	16.7	52.1	14.3
6/26/06	34	0	16.7	74.7	<5.00
7/5/06	35	0	21.7	9.8	<5.00
7/17/06	34	0	16.7	21.9	4.01J
8/7/06	34	0	16.7	23.6	18
8/14/06	34	0	16.7	<5.00	5.22
9/5-6/06	34	0	23	6.57	<5.10
9/18/06	34	0	24	6.29	<5.00
10/2/06	34	0	24	16.8	<5.00
10/16/06	34	2-3lb/10 g	41	39.6	2.22J
10/16/06	34	5-6lb/10g	81	92.3	19.4
10/18/06	34	5-6lb/10g	27	118	<5.00
11/7/06	35	2-4lb/10g	41	52.7	4.70J
11/20/06	35	2-4lb/10g	24	57.4	<5.00
11/30/06	35	5-6lb/10g	636	<50.0	<5.00
12/4/06	35	5-6lb/10g	59	<54.3	<5.00
12/6/06	35	5-6lb/10g	37	<52.6	<5.00
12/18/06	35	2-3lb/10 g	21	24.1	<5.00
1/8/07	35	2-3lb/10 g	21	16.7	<5.00

1/22/07	35	2-3lb/10 g	79	34.6	<5.00
2/5/07	35	2-3lb/10 g	27	25.9	<5.00
2/19/07	35	2-3lb/10 g	47	19.6	<5.00
3/5/07	35	2-3lb/10 g	27	<5.00	<5.00
3/19/07	35	2-3lb/10 g	25	NA	NA
4/9/07	35	2-3lb/10 g	23	<5.00	<5.00
4/23/07	35	2-3lb/10 g	30	7.27	<5.00
5/7/07	35	2-3lb/10 g	21	2.90J	<5.00
5/21/07	35	2-3lb/10 g	20	4.36J	<5.00
6/4/07	35	2-3lb/10 g	20	<5.00	<5.00
6/18/07	35	0	21	9.62	<5.00
7/9/07	35	0	20	15.0	<5.00
7/23/07	35	0	18	8.65	<5.00
8/6/07	0	0	1	191	9.19
9/10/07	35	0	23	217	26.4
9/24/07	35	0	18	16.2	19.4
10/10/07	35	2-3lb/10 g	18	5.63	1.15J
10/22/07	35	2-4lb/10g	18	1190	53.7
11/5/07	35	2-4lb/10g	18	209	7.93
11/19/07	35	2-4lb/10g	18	19.8	24.1
12/3/07	35	2-4lb/10g	18	20.1	<5.00
12/17/07	36	2-4lb/10g	32	87.4	1.20J
1/7/08	36	2-4lb/10g	23	<5.00	<5.00
1/21/08	36	2-4lb/10g	23	58	<5.00
2/4/08	36	2-4lb/10g	24	52	<5.00
2/18/08	35	2-4lb/10g	83	57	15
3/3/08	35	5-6lb/10g	580	<5.00	<5.00
3/17/08	35	5-6lb/10g	44	11	<5.00
4/7/08	35	5-6lb/10g	78	10	<5.00
4/12/08	35	5-6lb/10g	240	6.5	NA
4/13/08	35	5-6lb/10g	100	6.8	NA
4/14/08	35	5-6lb/10g	78	8.2	NA
5/10/08	36	5-6lb/10g	68	75	<5.00
5/27/08	0	0	18	189	<5.00
6/9/08	35	2-4lb/10g	30	77	<5.00
6/23/08	35	2-4lb/10g	580	5.6	<5.00
7/7/08	35	2-4lb/10g	80	194	189
7/10/08	35	5-6lb/10g	140	254	20
7/21/08	35	5-6lb/10g	42	477	<5.00
8/4/08	35	2-4lb/10g	22	108	14
8/18/08	35	2-4lb/10g	36	31	<5.00
9/1/08	35	2-4lb/10g	25	32	<5.00
9/22/08	35	2-4lb/10g	40	22	<5.00
10/6/08	35	2-4lb/10g	21	20	<5.00
10/20/08	33	2-4lb/10g	21	13	<5.00
11/3/08	35	2-4lb/10g	24	<5.00	<5.00
11/17/08	35	2-4lb/10g	30	28	<5.00
12/1/08	35	2-4lb/10g	24	12	<5.00
12/22/08	33	2-4lb/10g	24	<5.00	<5.00
1/5/09	35	2-4lb/10g	32	7.3	<5.00
1/26/09	32	2-4lb/10g	27	<5.00	<5.00
2/9/09	33	2-4lb/10g	90	<5.00	<5.00
2/23/09	33	2-4lb/10g	31	6	<5.00
3/9/09	34	2-4lb/10g	30	5.7	<5.00
3/23/09	33	2-4lb/10g	30	<5.00	<5.00

4/6/09	32	2-4lb/10g	38	5.8	<5.00
4/20/09	32	2-4lb/10g	243	8.5	<5.00
5/4/09	33	2-4lb/10g	343	8.2	8.7
5/18/09	33	2-4lb/10g	51	6.2	<5.00
6/8/09	35	2-4lb/10g	38	<5.00	<5.00
6/29/08	33	2-4lb/10g	25	9.1	<5.00
7/20/09	32	2-4lb/10g	47	39	<5.00
8/10/09	32	2-4lb/10g	23.7	31	<5.00
9/13/09	32	0	22	8	<5.00
10/12/09	32	0	104	21	<5.00
11/9/09	32	0	45	<50	<5.00
12/7/09	32	0	28	8.2	<5.00
1/10/10	32	0	42	13	<5.00
2/15/10	32	0	87	11.1	<5.00
3/15/10	32	0	35	<5.00	<5.00
4/15/10	32	0	40	9.62	<5.00
5/17/10	32	0	180	11	<5.00
6/13/10	32	0	43	15	<5.00
7/8/10	32	0	33	66	<2
8/19/10	0-20	0	17	16.3	<5.00
9/21/10	34	0	33	28.2	<5.00
10/18/10	37	0	20	14.9	<10.00
11/20/10	37	0	21	4.89	<4.00
12/16/10		0	23.55	6.15	<5.00
1/18/11	37	0	22.83	3.39	2.86
2/9/11	37	0	26.76	10.4	<10.0
3/17/11	37	0	49.03	14.2	<5.00
4/19/11	37	0	57.55	12.5	<5.00
5/2/11			310	11	
5/3/11			271	8.92	
5/4/11			156	10.8	
5/4/11			123	15.8	
5/5/11			83	18	
5/9/11	37	0	33.91	43.8	<5.00
6/9/11	0	0	6.8	52.4	<5.00
7/18/11	0	0	0.575	18.6	<5.00
8/15/11	0	0	1.004	38.9	<5.00
9/13/11	0	0	0.132	<5.00	<5.00
10/18/11		0	23.71	52.4	<5.00
11/16/11		0	29.64	30.6	<5.00
12/19/11		0	60.25	11.5	<5.00
1/19/12	40	0	31.82	<5.00	<5.00
2/14/12	40	0	40.38	6.68	<5.00
3/29/12	40	0	50.81	7.95	<5.00
4/18/12	40	0	22.54	20	<5.00
5/23/12	40	0	18.18	10.9	<5.00
6/11/12	40	0	17.87	7.13	<5.15
7/30/12	40	0	15.1	5.68	<5.00
8/24/12	40	0	13.75	<5.00	<5.00
9/24/12	0	0	0.4	73.2	<5.00
10/15/12	0	0	4.48	26.7	<5.00
11/19/12	0	0	0.73	28.8	<5.00
12/28/12	0	0	1.22	25	<1.00
1/16/13	0	0	3.72	40.5	2.12
2/24/13	0	0	4.1	45.3	<1.00

Weir Parameters

pH	Temp	DO %	Distance
7.46	17.57	341.9	12
7.07	16.08	216.4	15
7.85	15.4	209.1	12
7.91	12.46	247.6	12
6.41	13.08	241.1	12
6.71	14.26	256.3	12

3/13/13	0	0	23	18.6	<1.00	7.63	14.02	190.7	12	
4/22/13	0	0	21.62	26.7	<1.00	6.72	14.36	214.3	12	
5/16/13	0	0	14.33	18.3	<1.00	6.52	14.66	226.8	12	
6/21/13	0	0	1.44	22.3	<1.00	6.69	18.26	238	12	
7/23/13	0	0	0.934	27.1	<1.00	7.76	19.74	249.7	12	
8/23/13	0	0	5.27	65.4	<1.00	6.92	18.33	238.2	12	
9/18/13	0	0	1.43	54.6	<1.00	7.72	18.85	196.5	12	
10/16/13	0	0	1.63	66.1	<1.00	8.03	15.9	204.7	12	
11/13/13	0	0	2.68	115	1.71	7.25	11.72	236.4	12	
12/18/13	0	0	43.77	33	1.28	6.65	13.99	25.92*	12	measured as mg/L not as % DO
1/13/14	0	0	48.39	45.8	2.55	7.13	12.36	236.7	12	
2/17/14	0	0	6.1	75.4	<1.00	6.47	13.61	259.6	12	
3/17/14	0	0	151.5	12.8	2.47	7.1	13.4	121.6	12	Very heavy flow rate
4/23/14	0	0	11.26	49.4	<1.00	6.36	14.88	218.7	12	
5/19/14	0	0	56.62	73.9	<1.00	7.34	15.97	219.1	12	
6/4/14	0	0	2.45	65.7	<1.00	6.68	17.49	205.1	12	
7/9/14	0	0	2.32	87.1	<1.00	7.39	17.41	202	12	
8/14/14	0	0	0.26	47.6	<1.00	7.68	20.5	214.8	12	
9/10/14	0	0	0.25	12.1	<1.00	7.75	18.93	208.7	12	
10/22/14	0	0	2.02	137	<1.00	7.02	13.97	199.7	12	
11/17/14	0	0	1.71	103	<1.00	7.22	12.2	231.1	12	
12/16/14	0	0	13.86	45.9	<1.00	6.82	14	210.1	12	
1/13/15	0	0	5.47	88.4	<1.00	7.4	12.24	257.8	12	
2/11/15	0	0	2.29	118	<1.00	7.57	12.17	206.4	12	
3/17/15	0	0	47.44	20.7	1.06	7.08	13.58	13.68	12	measured as mg/L not as % DO
4/20/15	0	0	21.61	29.7	<1.00	6.76	14.11	158.7	12	
5/18/15	0	0	66.15	16.3	<1.00	6.19	13.91	121.5	12	

NOTES: Flow rates in gallons per minute (gpm)
O3 injection rates in pounds per 10 gallons
PCP concentrations in parts per billion (ppb)
NA - not analyzed
LE - Lab Error - samples not usable

Arkansas Analytical Inc.

11701 I-30 Bldg 1, Ste 115 - Little Rock, AR 72209
501-455-3233 Fax 501-455-6118

22 May 2015

Jim Fleer
McKesson Corporation - Env. Srvcs Dept.
One Post St. -- 34th Floor
San Francisco, CA 94104

RE: Arkwood Monthly Sampling

SDG Number: 1505285

Enclosed are the results of analyses for samples received by the laboratory on 19-May-15 09:57. If you have any questions concerning this report, please feel free to contact me.

Sample Receipt Information:

Custody Seals	✔
Containers Correct	✔
COC/Labels Agree	✔
Received On Ice	✔
Temperature on Receipt	4.0°C

Sincerely,

Norma James / Teresa Cains

Norma James
President

22 May 2015

Jim Fleer
McKesson Corporation - Env. Srvcs Dept.
One Post St. -- 34th Floor
San Francisco, CA 94104
Project: Arkwood Monthly Sampling

Project Number: May 2015
Date Received: 19-May-15 09:57

ANALYTICAL RESULTS

Lab Number: **1505285-01**
Sample Name: **Mouth**
Date/Time Collected: **5/18/15 12:30**
Sample Matrix: **Water**

Semivolatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Pentachlorophenol	ug/L	**16.3**		5/20/15 17:36	A505241	8270D, Rev 4, 2007
2,4,6-Tribromophenol [surr]	%	92.1		5/20/15 17:36	A505241	8270D, Rev 4, 2007
2-Fluorophenol [surr]	%	50.9		5/20/15 17:36	A505241	8270D, Rev 4, 2007
Phenol-d5 [surr]	%	38.1		5/20/15 17:36	A505241	8270D, Rev 4, 2007

ANALYTICAL RESULTS

Lab Number: **1505285-02**
Sample Name: **Weir**
Date/Time Collected: **5/18/15 12:15**
Sample Matrix: **Water**

Semivolatiles	Units	Result	Qualifier(s)	Date/Time Analyzed	Batch	Method
Pentachlorophenol	ug/L	< 1.00		5/20/15 17:14	A505241	8270D, Rev 4, 2007
2,4,6-Tribromophenol [surr]	%	76.6		5/20/15 17:14	A505241	8270D, Rev 4, 2007
2-Fluorophenol [surr]	%	41.2		5/20/15 17:14	A505241	8270D, Rev 4, 2007
Phenol-d5 [surr]	%	31.3		5/20/15 17:14	A505241	8270D, Rev 4, 2007

22 May 2015

Jim Fleer
McKesson Corporation - Env. Srvcs Dept.
One Post St. -- 34th Floor
San Francisco, CA 94104
Project: Arkwood Monthly Sampling

Project Number: May 2015
Date Received: 19-May-15 09:57

QUALITY CONTROL RESULTS

Semivolatiles - Quality Control
Analyzed: 20-May-15 15:48 By: KR

Analyte	Result	Reporting Limit	Units	Spike Level	Source Result	%REC	%REC Limits	RPD	RPD Limit	Notes
Batch A505241 - EPA 3510C_MS										
Blank (A505241-BLK1)				Prepared & Analyzed: 20-May-15						
Pentachlorophenol	ND	1.00	ug/L							
Surrogate: 2,4,6-Tribromophenol	*31.7*		"	*40.0*		*79.2*	*47.1-140*			
Surrogate: 2-Fluorophenol	*18.2*		"	*40.0*		*45.4*	*20.4-88.3*			
Surrogate: Phenol-d5	*13.8*		"	*40.0*		*34.5*	*11.7-70.7*			
LCS (A505241-BS1)				Prepared & Analyzed: 20-May-15						
Pentachlorophenol	36.3	1.00	ug/L	40.0		90.9	51.7-124			
Surrogate: 2,4,6-Tribromophenol	*33.7*		"	*40.0*		*84.3*	*66-132*			
Surrogate: 2-Fluorophenol	*19.6*		"	*40.0*		*49.0*	*41-72*			
Surrogate: Phenol-d5	*14.9*		"	*40.0*		*37.2*	*29-58*			
Matrix Spike (A505241-MS1)	**Source: 1505285-01**			Prepared & Analyzed: 20-May-15						
Pentachlorophenol	95.4	2.00	ug/L	80.0	16.3	98.8	41.2-140			
Surrogate: 2,4,6-Tribromophenol	*73.8*		"	*80.0*		*92.3*	*47.1-140*			
Surrogate: 2-Fluorophenol	*42.8*		"	*80.0*		*53.5*	*20.4-88.3*			
Surrogate: Phenol-d5	*32.3*		"	*80.0*		*40.4*	*14.7-66.9*			
Matrix Spike Dup (A505241-MSD1)	**Source: 1505285-01**			Prepared & Analyzed: 20-May-15						
Pentachlorophenol	93.2	2.00	ug/L	80.0	16.3	96.1	41.2-140	2.32	8.94	
Surrogate: 2,4,6-Tribromophenol	*72.5*		"	*80.0*		*90.7*	*47.1-140*			
Surrogate: 2-Fluorophenol	*37.2*		"	*80.0*		*46.5*	*20.4-88.3*			
Surrogate: Phenol-d5	*28.2*		"	*80.0*		*35.2*	*14.7-66.9*			

All Analysis performed according to EPA approved methodology when available:
SW 846, Revised December, 1996; EPA 600/4-79-020, Revised March, 1983; Standard Methods.
Instrument calibration and quality control samples performed at or above frequency specified in analytical method.

Reviewed by: Norma James / Teresa Coins

Norma James and/or Teresa Coins
Technical Director and/or QA Officer

Arkansas Analytical Inc.

11701 Interstate 30, Bldg. 1, Ste. 115
Little Rock, AR 72209
PHONE: 501-455-3233
FAX: 501-455-6118

CHAIN OF CUSTODY RECORD

CLIENT INFORMATION	Project Description	Turnaround Time	Preservation Codes:	
McKeeson Corporation	Arkwood Monthly Sampling	1 Day (100%)	1. Cool, 4 Degrees Centigrade	4. Thiosulfate for Dechlorination
14348 Nieman Rd.		2 Day (50%)	2. Sulfuric Acid (H_2SO_4), pH < 2	5. Hydrochloric Acid(HCl)
Overland Park KS 66221	Reporting Information	3 Day (25%)	3. Nitric Acid (HNO_3), pH < 2	6. Sodium Hydroxide (NaOH), pH > 12
	Telephone: 913-706-3422	5 Day (Routine)	TEST PARAMETERS	Bottle Type Code
Attn: Jim Fleer	Email: james.fleer@mckesson.com	Preservative Code:	1	G = Glass; P = Plastic
		Bottle Type:	GA	V = Septum; A = Amber

Sampler(s) Signature: James Fleer

Sampler(s) Printed: James Fleer

Field Number	SAMPLE COLLECTION Date/s	Time/s	Grab	Comp	Number of Bottles	Sample Matrix	SAMPLE IDENTIFICATION/ DESCRIPTION	Pentachlorophenol (8270D)	Arkansas Analytical Work Order Number: 15055285
	5/18/15	12:30	X		2	Water	Mouth	X	01
	5/18/15	12:15	X		2	Water	Weir	X	02

ONSITE MEASUREMENTS BY Oxford Environmental

	pH	Temperature	DO%
Mouth	6.06	13.47	62.0
Weir	6.19	13.91	121.5

1. Relinquished by: (Signature)	Date/Time	2. Received by: (Signature)	SAMPLE CONDITION UPON RECEIPT IN LAB	REMARKS / SAMPLE COMMENTS
	5/18/15 14:00	UPS	1. CUSTODY SEALS: ✓ Yes ___ No	Flow Rate - 66.15
			2. CONTAINERS CORRECT: ___ Yes ___ No	O_3 Power - 45
			3. COC/LABELS AGREE: ___ Yes ___ No	O_3 Conc - 2.84
3. Relinquished by: (Signature)	Date/Time	4. Received by lab: (Signature)	4. RECEIVED ON ICE: ___ Yes ___ No	O_3 Residual - 0.00
UPS	5-19-15 0957	Amanda Johnson	5. TEMPERATURE ON RECEIPT: 4°C	
			6. TEMPERATURE GUN ID: HHH2	
			FOR COMPLETION BY LAB ONLY	

June 04, 2015

Vista Project I.D.: 1500447

Mr. James Fleer
McKesson Corporation
14348 Nieman Road
Overland Park, KS 66221

Dear Mr. Fleer,

Enclosed are the results for the sample set received at Vista Analytical Laboratory on May 19, 2015. This sample set was analyzed on a rush turn-around time, under your Project Name 'Arkwood'.

Vista Analytical Laboratory is committed to serving you effectively. If you require additional information, please contact me at 916-673-1520 or by email at mmaier@vista-analytical.com.

Thank you for choosing Vista as part of your analytical support team.

Sincerely,

Martha Maier
Laboratory Director

Vista Work Order No. 1500447
Case Narrative

Sample Condition on Receipt:

Two aqueous samples were received in good condition and within the method temperature requirements. The samples were received and stored securely in accordance with Vista standard operating procedures and EPA methodology.

Analytical Notes:

EPA Method 1613

These samples were extracted and analyzed for tetra-through-octa chlorinated dioxins and furans by EPA Method 1613 using a ZB-5MS GC column.

Holding Times

These samples were extracted and analyzed within the method hold times.

Quality Control

The Initial Calibration and Continuing Calibration Verifications met the method acceptance criteria.

A Method Blank and Ongoing Precision and Recovery (OPR) sample were extracted and analyzed with the preparation batch. No analytes were detected in the Method Blank. The OPR recoveries were within the method acceptance criteria.

Labeled standard recoveries for all QC and field samples were within method acceptance criteria.

TABLE OF CONTENTS

Sample Inventory Report

Vista Sample ID	Client Sample ID	Sampled	Received	Components/Containers
1500447-01	Weir	18-May-15 11:45	19-May-15 09:24	Amber Glass NM Bottle, 1L
				Amber Glass NM Bottle, 1L
1500447-02	Mouth	18-May-15 12:00	19-May-15 09:24	Amber Glass NM Bottle, 1L
				Amber Glass NM Bottle, 1L

Vista Project: 1500447

Client Project: Arkwood

ANALYTICAL RESULTS

Sample ID: Method Blank

EPA Method 1613B

Matrix: Aqueous
Sample Size: 1.00 L

QC Batch: B5F0002
Date Extracted: 01-Jun-2015 8:08

Lab Sample: B5F0002-BLK1
Date Analyzed : 03-Jun-15 14:10 Column: ZB-5MS Analyst: MAS

Analyte	Conc. (pg/L)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	0.701		
1,2,3,7,8-PeCDD	ND	1.60		
1,2,3,4,7,8-HxCDD	ND	2.80		
1,2,3,6,7,8-HxCDD	ND	2.72		
1,2,3,7,8,9-HxCDD	ND	2.71		
1,2,3,4,6,7,8-HpCDD	ND	2.17		
OCDD	ND	3.42		
2,3,7,8-TCDF	ND	0.563		
1,2,3,7,8-PeCDF	ND	0.944		
2,3,4,7,8-PeCDF	ND	0.999		
1,2,3,4,7,8-HxCDF	ND	0.869		
1,2,3,6,7,8-HxCDF	ND	0.893		
2,3,4,6,7,8-HxCDF	ND	1.02		
1,2,3,7,8,9-HxCDF	ND	0.911		
1,2,3,4,6,7,8-HpCDF	ND	0.991		
1,2,3,4,7,8,9-HpCDF	ND	0.770		
OCDF	ND	1.89		
TOTALS				
Total TCDD	ND	0.701		
Total PeCDD	ND	1.60		
Total HxCDD	ND	4.05		
Total HpCDD	ND	2.17		
Total TCDF	ND	0.563		
Total PeCDF	ND	2.08		
Total HxCDF	ND	1.03		
Total HpCDF	ND	1.02		

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	79.5	25 - 164	
	13C-1,2,3,7,8-PeCDD	78.8	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	74.8	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	75.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	74.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	70.2	23 - 140	
	13C-OCDD	65.2	17 - 157	
	13C-2,3,7,8-TCDF	80.5	24 - 169	
	13C-1,2,3,7,8-PeCDF	75.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	77.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	74.3	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	73.8	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	73.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	68.7	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	57.3	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	59.4	26 - 138	
	13C-OCDF	58.8	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	90.2	35 - 197	
	Toxic Equivalent Quotient (TEQ) Data			
	TEQMinWHO2005Dioxin	0.00		

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: OPR **EPA Method 1613B**

Matrix: Aqueous
Sample Size: 1.00 L

QC Batch: B5F0002
Date Extracted: 01-Jun-2015 8:08

Lab Sample: B5F0002-BS1
Date Analyzed: 03-Jun-15 11:46 Column: ZB-5MS Analyst: MAS

Analyte	Amt Found (pg/L)	Spike Amt	%R	Limits
2,3,7,8-TCDD	165	200	82.7	67 - 158
1,2,3,7,8-PeCDD	909	1000	90.9	70 - 142
1,2,3,4,7,8-HxCDD	939	1000	93.9	70 - 164
1,2,3,6,7,8-HxCDD	886	1000	88.6	76 - 134
1,2,3,7,8,9-HxCDD	888	1000	88.8	64 - 162
1,2,3,4,6,7,8-HpCDD	862	1000	86.2	70 - 140
OCDD	1840	2000	91.9	78 - 144
2,3,7,8-TCDF	176	200	87.9	75 - 158
1,2,3,7,8-PeCDF	897	1000	89.7	80 - 134
2,3,4,7,8-PeCDF	882	1000	88.2	68 - 160
1,2,3,4,7,8-HxCDF	948	1000	94.8	72 - 134
1,2,3,6,7,8-HxCDF	1120	1000	112	84 - 130
2,3,4,6,7,8-HxCDF	916	1000	91.6	70 - 156
1,2,3,7,8,9-HxCDF	927	1000	92.7	78 - 130
1,2,3,4,6,7,8-HpCDF	899	1000	89.9	82 - 122
1,2,3,4,7,8,9-HpCDF	864	1000	86.4	78 - 138
OCDF	1820	2000	91.1	63 - 170

	Labeled Standard	%R	LCL-UCL
IS	13C-2,3,7,8-TCDD	76.0	20 - 175
	13C-1,2,3,7,8-PeCDD	76.1	21 - 227
	13C-1,2,3,4,7,8-HxCDD	69.4	21 - 193
	13C-1,2,3,6,7,8-HxCDD	75.4	25 - 163
	13C-1,2,3,7,8,9-HxCDD	70.6	21 - 193
	13C-1,2,3,4,6,7,8-HpCDD	65.6	26 - 166
	13C-OCDD	61.9	13 - 199
	13C-2,3,7,8-TCDF	74.1	22 - 152
	13C-1,2,3,7,8-PeCDF	74.5	21 - 192
	13C-2,3,4,7,8-PeCDF	77.4	13 - 328
	13C-1,2,3,4,7,8-HxCDF	68.1	19 - 202
	13C-1,2,3,6,7,8-HxCDF	50.4	21 - 159
	13C-2,3,4,6,7,8-HxCDF	71.3	22 - 176
	13C-1,2,3,7,8,9-HxCDF	69.1	17 - 205
	13C-1,2,3,4,6,7,8-HpCDF	56.9	21 - 158
	13C-1,2,3,4,7,8,9-HpCDF	56.8	20 - 186
	13C-OCDF	57.3	13 - 199
CRS	37Cl-2,3,7,8-TCDD	90.8	31 - 191

LCL-UCL - Lower control limit - upper control limit

Sample ID: Weir

EPA Method 1613B

Client Data
Name: McKesson Corporation
Project: Arkwood
Date Collected: 18-May-2015 11:45

Sample Data
Matrix: Aqueous
Sample Size: 1.00 L

Laboratory Data
Lab Sample: 1500447-01 Date Received: 19-May-2015 9:24
QC Batch: B5F0002 Date Extracted: 01-Jun-2015 8:08
Date Analyzed : 03-Jun-15 17:23 Column: ZB-5MS Analyst: MAS

Analyte	Conc. (pg/L)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	1.31		
1,2,3,7,8-PeCDD	ND	1.99		
1,2,3,4,7,8-HxCDD	3.30			J
1,2,3,6,7,8-HxCDD	26.4			
1,2,3,7,8,9-HxCDD	4.86			J
1,2,3,4,6,7,8-HpCDD	1170			
OCDD	11500			
2,3,7,8-TCDF	ND	0.794		
1,2,3,7,8-PeCDF	ND		1.12	
2,3,4,7,8-PeCDF	ND		1.47	
1,2,3,4,7,8-HxCDF	16.8			J
1,2,3,6,7,8-HxCDF	ND		3.58	
2,3,4,6,7,8-HxCDF	7.44			J
1,2,3,7,8,9-HxCDF	2.43			J
1,2,3,4,6,7,8-HpCDF	174			
1,2,3,4,7,8,9-HpCDF	26.3			
OCDF	1030			
TOTALS				
Total TCDD	ND	1.31		
Total PeCDD	ND		7.65	
Total HxCDD	84.0		86.8	
Total HpCDD	1770			
Total TCDF	ND		2.79	
Total PeCDF	12.2		17.0	
Total HxCDF	219		224	
Total HpCDF	892		897	

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	88.1	25 - 164	
	13C-1,2,3,7,8-PeCDD	82.2	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	79.2	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	82.2	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	82.5	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	81.4	23 - 140	
	13C-OCDD	81.8	17 - 157	
	13C-2,3,7,8-TCDF	85.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	80.0	24 - 185	
	13C-2,3,4,7,8-PeCDF	80.0	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	80.9	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	82.2	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	81.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	75.5	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	72.4	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	72.6	26 - 138	
	13C-OCDF	72.9	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	91.8	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

TEQMinWHO2005Dioxin	23.6

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

Sample ID: Mouth

EPA Method 1613B

Client Data
Name: McKesson Corporation
Project: Arkwood
Date Collected: 18-May-2015 12:00

Sample Data
Matrix: Aqueous
Sample Size: 0.964 L

Laboratory Data
Lab Sample: 1500447-02 Date Received: 19-May-2015 9:24
QC Batch: B5F0002 Date Extracted: 01-Jun-2015 8:08
Date Analyzed : 03-Jun-15 18:11 Column: ZB-5MS Analyst: MAS

Analyte	Conc. (pg/L)	DL	EMPC	Qualifiers
2,3,7,8-TCDD	ND	1.33		
1,2,3,7,8-PeCDD	ND	0.944		
1,2,3,4,7,8-HxCDD	ND	2.98		
1,2,3,6,7,8-HxCDD	19.0			J
1,2,3,7,8,9-HxCDD	3.89			J
1,2,3,4,6,7,8-HpCDD	879			
OCDD	9290			
2,3,7,8-TCDF	ND	0.815		
1,2,3,7,8-PeCDF	ND	1.35		
2,3,4,7,8-PeCDF	ND		1.60	
1,2,3,4,7,8-HxCDF	13.3			J
1,2,3,6,7,8-HxCDF	ND		2.59	
2,3,4,6,7,8-HxCDF	4.92			J
1,2,3,7,8,9-HxCDF	1.81			J
1,2,3,4,6,7,8-HpCDF	130			
1,2,3,4,7,8,9-HpCDF	19.6			J
OCDF	799			
TOTALS				
Total TCDD	ND	1.33		
Total PeCDD	ND	1.74		
Total HxCDD	51.5		54.5	
Total HpCDD	1310			
Total TCDF	ND	0.815		
Total PeCDF	3.37		7.40	
Total HxCDF	156		164	
Total HpCDF	680			

	Labeled Standard	%R	LCL-UCL	Qualifiers
IS	13C-2,3,7,8-TCDD	77.8	25 - 164	
	13C-1,2,3,7,8-PeCDD	86.5	25 - 181	
	13C-1,2,3,4,7,8-HxCDD	78.0	32 - 141	
	13C-1,2,3,6,7,8-HxCDD	83.8	28 - 130	
	13C-1,2,3,7,8,9-HxCDD	81.9	32 - 141	
	13C-1,2,3,4,6,7,8-HpCDD	82.0	23 - 140	
	13C-OCDD	79.9	17 - 157	
	13C-2,3,7,8-TCDF	82.0	24 - 169	
	13C-1,2,3,7,8-PeCDF	84.8	24 - 185	
	13C-2,3,4,7,8-PeCDF	85.8	21 - 178	
	13C-1,2,3,4,7,8-HxCDF	85.1	26 - 152	
	13C-1,2,3,6,7,8-HxCDF	85.1	26 - 123	
	13C-2,3,4,6,7,8-HxCDF	82.1	28 - 136	
	13C-1,2,3,7,8,9-HxCDF	76.2	29 - 147	
	13C-1,2,3,4,6,7,8-HpCDF	69.2	28 - 143	
	13C-1,2,3,4,7,8,9-HpCDF	72.5	26 - 138	
	13C-OCDF	73.5	17 - 157	
CRS	37Cl-2,3,7,8-TCDD	59.7	35 - 197	

Toxic Equivalent Quotient (TEQ) Data

	TEQMinWHO2005Dioxin	17.6

DL - Sample specifc estimated detection limit

EMPC - Estimated maximum possible concentration

LCL-UCL- Lower control limit - upper control limit

Min-The TEQ is calculated using zero for the concentration of congeners that are not detected.

DATA QUALIFIERS & ABBREVIATIONS

B	**This compound was also detected in the method blank.**
D	**Dilution**
E	**The associated compound concentration exceeded the calibration range of the instrument.**
H	**Recovery and/or RPD was outside laboratory acceptance limits.**
I	**Chemical Interference**
J	**The amount detected is below the Lower Calibration Limit of the instrument.**
*****	**See Cover Letter**
Conc.	**Concentration**
DL	**Sample-specific estimated detection limit**
MDL	**The minimum concentration of a substance that can be measured and reported with 99% confidence that the analyte concentration is greater than zero in the matrix tested.**
EMPC	**Estimated Maximum Possible Concentration**
NA	**Not applicable**
RL	**Reporting Limit – concentrations that correspond to low calibration point**
ND	**Not Detected**
TEQ	**Toxic Equivalency**

Unless otherwise noted, solid sample results are reported in dry weight. Tissue samples are reported in wet weight.

CERTIFICATIONS

Accrediting Authority	Certificate Number
California Department of Health – ELAP	2892
DoD ELAP - A2LA Accredited - ISO/IEC 17025:2005	3091.01
Florida Department of Health	E87777
Hawaii Department of Health	N/A
Louisiana Department of Environmental Quality	01977
Maine Department of Health	2014022
Michigan Department of Natural Resources	9932
Nevada Division of Environmental Protection	CA004132015-1
New Jersey Department of Environmental Protection	CA003
New York Department of Health	11411
North Carolina Department of Health & Human Services	06700
Oregon Laboratory Accreditation Program	4042-003
Pennsylvania Department of Environmental Protection	011
South Carolina Department of Health	87002001
Tennessee Department of Environment & Conservation	TN02996
Texas Commission on Environmental Quality	T104704189-15-6
Virginia Department of General Services	3138
Washington Department of Ecology	C584
Wisconsin Department of Natural Resources	998036160

CHAIN OF CUSTODY

Vista

FOR LABORATORY USE ONLY

Laboratory Project ID: 1500447

Storage Secured: Yes ☑ No ☐

Storage ID: WR-2 Temp: 1.9 °C

TAT: (Check One):

Standard: ● 21 Days

Rush (surcharge may apply):

○ 14 days ○ 7 days Specify:___

Project I.D.: Arkwood P.O.#: Sampler: James Fleer (Name)

Invoice to: Name	Company	Address	City	State	Zip	Ph#	Fax#
James Fleer	McKesson Corp	One Post Street 34th Floor	San Francisco	CA	94104	913 238-8348	

Relinquished by: (Signature and Printed Name) James Fleer	Date: 5/18	Time: 1400	Received by: (Signature and Printed Name) B. Benedict	Date: 05/19/15	Time: 0933
Relinquished by: (Signature and Printed Name)	Date:	Time:	Received by: (Signature and Printed Name)	Date:	Time:

See "Sample Log-in Checklist" for additional sample information

SHIP TO: Vista Analytical Laboratory
1104 Windfield Way
El Dorado Hills, CA 95762
(916) 673-1520 • Fax (916) 673-0106

ATTN:

Method of Shipment: UPS

Tracking No.:

Add Analysis(es) Requested

Sample ID	Date	Time	Location/Sample Description	Container(s) Quantity	Type	Matrix	EPA1613 2378-TCDD	EPA1613 2378-TCDD/TCDF	EPA1613 PCDD/PCDF	EPA8290 2378-TCDD	EPA8290 2378-TCDD/TCDF	EPA8290 PCDD/PCDF	EPA8280 2378-TCDD	EPA8280 2378-TCDD/TCDF	EPA8280 PCDD/PCDF	EPA1668 TOTALS	EPA1668 COPLANAR PCB's	EPA1668 209 CONGENEKS	EPA1668 PBDE	EPA1614 PAH	CARB429 WHO-29
Weir	5/18	1145	Treatment Plant effluent	2	A	AQ			X												
Mouth	5/18	1210	Treatment Plant influent	2	A	AQ			X												
Flow rate 67.88 gpm																					

Special Instructions/Comments:

SEND DOCUMENTATION AND RESULTS TO:

Name: James Fleer
Company: McKesson Corporation
Address: One Post Street 34th Floor
City: San Francisco State: CA Zip: 94104
Phone: 913 238 8348 Fax:
Email: james.fleer@mckesson.com

Container Types: A = 1 Liter Amber, G = Glass Jar
P = PUF, T = MM5 Train, O= Other

*Bottle Preservative Type: T = Thiosulfate,
O = Other

Matrix Types: DW = Drinking Water, EF = Effluent, PP = Pulp/Paper,
SD = Sediment, SL = Sludge, SO = Soil, WW = Wastewater, B = Blood/Serum
AQ = Aqueous, O = Other

WHITE - ORIGINAL YELLOW - ARCHIVE PINK - COPY

SAMPLE LOG-IN CHECKLIST

Vista Analytical Laboratory

Vista Project #: 1500447 **TAT** Std

Samples Arrival:	**Date/Time** 05/19/15 0924		**Initials:** CBLB		**Location:** WR-2 **Shelf/Rack:** NA	
Logged In:	**Date/Time** 05/20/15 1214		**Initials:** CBLB		**Location:** WR-2 **Shelf/Rack:** B3	
Delivered By:	FedEx	UPS	On Trac	DHL	Hand Delivered	Other
Preservation:	Ice	Blue Ice		Dry Ice	None	
Temp °C: 1.8 (uncorrected) **Temp °C:** 1.9 (corrected)	**Time:** 0932			**Thermometer ID:** IR-1		

	YES	NO	NA
Adequate Sample Volume Received? A & B Containers	✓		
Holding Time Acceptable?	✓		
Shipping Container(s) Intact?	✓		
Shipping Custody Seals Intact?	✓		
Shipping Documentation Present?	✓		
Airbill Trk # 1Z A4X 5030 1406 3228 7	✓		
Sample Container Intact?	✓		
Sample Custody Seals Intact?			✓
Chain of Custody / Sample Documentation Present?	✓		
COC Anomaly/Sample Acceptance Form completed?		✓	
If Chlorinated or Drinking Water Samples, Acceptable Preservation?			✓

$Na_2S_2O_3$ Preservation Documented?		COC	Sample Container	None	
Shipping Container	Vista	Client	Retain	Return	Dispose

Comments:

Sample Login 11/2013 ckt